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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,517	03/05/2002	Claude Jaussaud	220040US2PCT	9383

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EXAMINER

GUERRERO, MARIA F

ART UNIT PAPER NUMBER

2822

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,517

Applicant(s)

JAUSSAUD ET AL.

Examiner

Maria Guerrero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed March 5, 2002.

Claims 1-10 are canceled.

Claims 11-20 are pending.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11 and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Linn et al. (U.S. 5,387,555).
5. Linn et al. teaches a method of creating an electrically conducting bonding between a face of a first semiconductor element and face of a second semiconductor

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element by heat treatment (col. 4, lines 1-15). Linn et al. discloses depositing at least one layer of material on the face of the first semiconductor element and at least one layer of material on the face of the second semiconductor element (Fig. 3a, 5a, col. 3, lines 49-56). Linn et al. teaches combining the layers to form a layer that provides electrically conducting bonding between the two faces (Fig. 3b, Fig. 5b, col. 3, lines 56-65, col. 4, lines 5-15). Linn et al. shows applying the first and second faces one against the other and carrying out a heat treatment (Fig. 3b, 5b, col. 3, lines 55-65). Linn et al. teaches reacting the layers of material to form a temperature stable mixture with respect to the first and second semiconductor elements (col. 3, lines 55-68, col. 5, lines 35-67, col. 6, lines 1-6). Linn et al. discloses not inducing any reaction product between the deposited layer of material and at least one of the semiconductor elements during the heat treatment (Fig. 4a-4b, col. 5, lines 35-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linn et al. (U.S. 5,387,555) in view of Goesele et al. (U.S. 5,877,070).
7. Linn et al. also teaches the interposed layers comprising a layer of tungsten and a layer of silicon that could be on one of or both faces (col. 8, lines 20-25). Linn et al. teaches forming WSi₂ during the heat treatment (Fig. 5b, col. 7, lines 3-15).

Regarding claim 17, Linn et al. does not specifically show the first and second semiconductor elements being SIC. However, Goesele et al. shows the use of SIC in the bonding process as conventional in the art (col. 3, lines 50-60, col. 6, lines 15-16).

Regarding claims 12 and 18-20, Linn et al. does not specifically show the preliminary step of forming a thin film by forming microcavities on a substrate by ionic implantation. However, Goesele et al. teaches forming the thin film on the substrate by forming microcavities using ionic implantation (col. 6, lines 15-20, col. 10, lines 13-30).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Linn et al. reference by including the steps of forming the thin film on the substrate by forming microcavities using ionic implantation and using SIC as taught Goesele et al. in order to increase device performance and thermal stability.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yallup et al. "Buried Six SOI structures", Goh et al. "Buried metallic layers in silicon using wafer fusion bonding techniques", Bruel (U.S. 5,374,564), and Merchant et al. (U.S. 6,118,181) show bonding semiconductor elements.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Maria Guerrero
Patent Examiner
June 28, 2003